

## CLAIMS

What is claimed is:

1. A dry etching process including:

introducing a processing gas into a vacuum chamber to  
5 achieve a predetermined controlled pressure level therein;  
applying radio frequency power to a substrate placed  
within the vacuum chamber for generating plasma in the vacuum  
chamber, whereby the substrate is processed, the substrate  
having a plurality of stacked layers including metal layers;

0 etching the layers on the substrate with the processing  
gas until a time point when the surface of a lowermost layer  
on the substrate is etched; and

adding CHF<sub>3</sub> gas to the processing gas for etching the  
lowermost layer on the substrate.

5 2. The dry etching process according to Claim 1,  
wherein the etching process is effected through a method of  
determining a layer being processed.

3. The dry etching process according to Claim 1,  
wherein the lowermost layer on the substrate is the subject to  
be etched.

4. The dry etching process according to claim 2,  
wherein the method of determining is monitoring the etching

process by detecting plasma light intensity.

5. The dry etching process according to Claim 4,  
wherein the processing gas is one of  $Cl_2$  and a gaseous mixture  
5 containing  $Cl_2$ .

6. The dry etching process according to Claim 5,  
wherein a non-aluminum reactive gas is added when the  
substrate includes a layer of aluminum.

7. The dry etching process according to Claim 6,  
wherein the proportion of CHF<sub>3</sub> gas is 40% or less with respect  
to the total flow rate of the processing gas.

8. The dry etching process according to Claim 6,  
wherein the proportion of CHF<sub>3</sub> gas is between 5% and 40% with  
respect to the total flow rate of the processing gas.

9. The dry etching process according to Claim 6,  
0 wherein the proportion of CHF<sub>3</sub> gas is 15% or less with respect  
to the total flow rate of the processing gas.

10. The dry etching process according to Claim 6,  
wherein the proportion of CHF<sub>3</sub> gas is between 5% to 15% with  
5 respect to the total flow rate of the processing gas.

11. The dry etching process according to Claim 6,  
wherein the proportion of CHF<sub>3</sub> gas is between 15% to 40% with  
respect to the total flow rate of the processing gas.

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12. The dry etching process according to one of Claims  
7-11, wherein the lowermost layer on the substrate includes  
titanium.

0 13. The dry etching process according to one of Claims  
7-11, wherein the metal layers of the plurality of stacked  
layers comprise an aluminum middle layer and titanium top and  
bottom layers.

5 14. The dry etching process according to Claim 2,  
wherein the method of determining is based upon the sampling  
data obtained from the experimentation.

0 15. The dry etching process according to Claim 14,  
wherein the processing gas is one of Cl<sub>2</sub> and a gaseous mixture  
containing Cl<sub>2</sub>.

5 16. The dry etching process according to Claim 15,  
wherein a non-aluminum reactive gas is added when the  
substrate includes a layer of aluminum.

17. The dry etching process according to Claim 16,  
wherein the proportion of CHF<sub>3</sub> gas is 40% or less with respect  
to the total flow rate of the processing gas.

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18. The dry etching process according to Claim 16,  
wherein the proportion of CHF<sub>3</sub> gas is between 5% and 40% with  
respect to the total flow rate of the processing gas.

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19. The dry etching process according to Claim 16,  
wherein the proportion of CHF<sub>3</sub> gas is 15% or less with respect  
to the total flow rate of the processing gas.

5 20. The dry etching process according to Claim 16,  
wherein the proportion of CHF<sub>3</sub> gas is between 5% and 15% with  
respect to the total flow rate of the processing gas.

0 21. The dry etching process according to Claim 16,  
wherein the proportion of CHF<sub>3</sub> gas is between 15% and 40% with  
respect to the total flow rate of the processing gas.

22. The dry etching process according to one of Claims  
17-21, wherein the lowermost layer on the substrate includes  
titanium.

23. The dry etching process according to one of Claims 17-21, wherein the metal layers of the plurality of stacked layers comprise an aluminum middle layer and titanium top and bottom layers.

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